

17.0 LANDSCAPING

17.1 Design Requirements

17.1.1 Re-vegetation Plan

The Contractor shall install re-vegetation as described herein. A temporary re-vegetation plan shall be required for any area of the Work where construction disturbance occurs, and shall be developed in conjunction with erosion control requirements, as defined in Book 3. A final re-vegetation plan is required where final seeding or permanent stabilization will occur.

Re-vegetation design and plans shall include the mitigation measures as described and as listed below:

- Cut and fill slopes shall be minimized and the cut line blended into the existing terrain.
- Re-vegetation shall occur immediately, not greater than 48 hours, after construction of the individual area to stabilize soils and reduce visual contrasts.
- Removal of adjacent vegetation shall be minimized where possible. Areas that lose vegetation providing important visual screens will be re-vegetated with plant species (trees and shrubs) that serve the same function.
- Soil tests shall be conducted to determine specific amendments if required.
- Contractor shall meet with the CDOT Project Director to review re-vegetation plans before installation.
- Native seeding areas shall be replanted for Contract compliance.
- All disturbed areas shall be revegetated with native grass and forb species. Seed, mulch and mulch tackifier shall be applied in phases throughout construction.
- Temporary erosion control and sediment control BMPs shall be maintained until the native seeded areas contain a minimum of 90 percent grass species, and no noxious weeds. Native seed areas shall have 80 percent coverage prior to Final Acceptance.
- Silt fencing and other BMPs shall be used to prevent degradation of habitats adjacent to construction area.
- Temporary and permanent disturbances to wetlands as well as all protection methods for existing wetlands and wetland mitigation measures shall be shown.

17.2 Construction Requirements

17.2.1 Temporary Seeding and Stabilization

Disturbed areas not to be permanently stabilized on the Project shall comply with all requirements of the Contract and CDOT Erosion Control and Stormwater Quality Guide for temporary seeding and stabilization.

17.2.2 Clearing and Work Area Limits Identification and Protection

The Contractor shall delineate the clearing and work limits in areas adjacent to existing wetlands, trees, and significant vegetation for Acceptance by the CDOT Project Director. Upon Acceptance the Contractor shall install temporary orange fencing in these areas with to identify the clearing boundary. The Contractor shall flag those trees adjacent to the boundary that are to remain in place. The Contractor shall use all appropriate care to avoid damage or removal of the flagged trees. Trees that are damaged shall be replaced at the Contractor's expense. Trees that are damaged and assessed as salvageable shall be promptly repaired, pruned, wrapped, and protected from further damage at the Contractor's expense. Flagged trees removed during construction will be replaced at a 2:1 ratio with 2 inch caliper trees. All replacement trees and shrubs shall be native species per the State of Colorado portion of "The Roadside Use of Native Plants", August 2000 USDOT, FHWA publication.

The Contractor shall mitigate impacts to trees and vegetation in riparian area in compliance with Section 5.

The Contractor shall repair or replace in kind all landscape material and vegetation on private property which is disturbed by the Work. Replaced materials shall be equal or better to the existing materials in size, type and condition.

The Contractor shall repair, replace, relocate, or adjust all irrigation system components on private property which are disturbed by the Work. Replaced materials shall be equal or better to the existing materials in type and function.

17.2.3 Trees and Shrubs**17.2.3.1 Removal of Trees and Shrubs**

Tree stumps within the roadway prism or within 10 feet of the edges of roadway pavements shall be completely removed and disposed off the Project site. All other tree stumps within the Project shall be ground 3 feet below finished grade.

All trees or shrubs removed from the Project shall become the property of the Contractor and be completely disposed of off-site by the Contractor.

17.2.3.2 Pruning

The Contractor shall have all root and branch pruning that interfere with the Work completed by a licensed and certified tree surgeon. All Work shall be in accordance with American National Standard Institute – ANSI A300-1995, Section 5.3.3.2.

17.2.4 Topsoil

The Contractor shall stockpile topsoil in accordance with Book 2, Section 17.2.7. The Contractor shall import topsoil and/or prepare soil using soil preparation as specified in the Book 2, Section 17.2.7. All topsoil, either imported or salvaged on Site, shall be treated with an herbicide for noxious weeds, prior to final seeding.

17.2.5 Permanent Native Seeding

Placement of fertilizer, seeding and mulching shall not be done in a single operation, and shall be completed immediately, not greater than 48 hours, following each construction phase or prior to any winter shutdown Work. All seeding requirements in the Approved Project SWMP shall also be followed. Fertilizer shall not be used adjacent to wetlands and waterways. Refer to the Project Special Provisions and Standard Specification Section 212 for additional requirements.

All disturbed areas within the Right-of-Way which are not surfaced shall be re-vegetated to replicate or enhance native vegetative communities. Re-vegetation species that attract wildlife to the Highway or practices that allow noxious weeds shall not be used.

Seeding shall be drilled 1/4-inch to 1/2-inch into the soil. In areas where machine seeding is impossible, hand seeding at double the contract rate, and raked into the soil, may be used if Approved by CDOT.

Tackifier shall be applied at a rate of 150 pounds per acre.

All native seeding areas shall be mulched and mechanically crimped with 1.5 tons per acre of weed free hay.

Soil retention blanket shall be used for slopes steeper than 3H:1V. If soil retention blanket is used, mulch and tackifier are not required.

The Contractor shall use the following seed mix for locations within the Project:

"Dry Land Pasture Mix" by Arkansas Valley Seed

17.2.6 Noxious Weed Management Plan

The Contractor shall use CDOT's standard protocol for weed management, including the development of an Integrated Noxious Weed Management Plan (INWMP) to mitigate the potential adverse effects of earth disturbance. Noxious weeds shall be spot sprayed. In locations where spot application is not practicable a wildlife biologist will inspect the area prior to spraying to ensure crucial habitat will not be impacted. The INWMP is fully described on accompanying project special provisions for Environmental Requirements.

17.2.7 Project Special Provisions

The following specifications modify and take precedence over the Standard Specifications.

REVISION OF SECTIONS 207 AND 212 TOPSOIL

Sections 207 and 212 of the Standard Specification are hereby revised for this Project as follows:

Subsection 207.01 shall include the following:

This Work includes importing or salvaging on site topsoil that is to be placed on disturbed areas within the Project.

Subsection 207.02 shall include the following:

The Contractor may salvage existing on site topsoil and/or import topsoil and/or prepare soil using soil preparation. If imported topsoil is used the Contractor shall submit a written notice to CDOT at least 30 days before hauling soil to the site. The Contractor shall supply a sample of the topsoil to Colorado State University Testing Laboratory for analysis. A Certificate of Compliance shall be submitted to the Engineer and to CDOT to verify the organic matter content, pH, sodium absorption ratio, electrical conductivity, and nutrient requirements.

Contractor supplied topsoil shall meet the following criteria:

Property	Minimum Value	Maximum Value
pH	6.5	7.8
Sodium Absorption Ratio	-	10.0
Salts (electrical conductivity)	-	4.0 mmhos/cm
Organic matter	3.0%	10%

The area where imported topsoil is excavated and/or stored shall be free of noxious weeds.

Topsoil shall contain the following minimum ammonium DPTA (chelate) extractable nutrients (the extracting solution used by CSU Soil Testing Laboratory).

Nitrogen	5 ppm air dried basis
Phosphorus	5 ppm
Potassium	30 ppm
Iron (Fe)	5 ppm

Topsoil shall not include any minerals or elements detrimental to plant growth. All rocks and debris larger than 4 inches in diameter, that are visible after topsoil is spread, shall be removed and disposed of in an appropriate manner on the Project site.

At the Contractor's option soil preparation as described below may be used instead of topsoil.

Subsection 212.01 shall include the following:

The Work shall consist of incorporation of an organic amendment into the top 6 inches of the soil to be seeded.

Subsection 212.02 shall include the following:

Soil amendments to be tilled into the native seeding shall include:

Three cubic yards of organic amendment per 1,000 square feet.

The organic amendment shall include the following:

An organic product containing a mixture of composed cow or sheep manure and wood residue that has been aerobically and naturally processed in such a manner as to maintain a consistent temperature of 140 degrees Fahrenheit or greater for a period of time that is long enough to accomplish the following specifications:

1. The windrows of composted organic amendment (cow or sheep manure) have to be composed for 70 to 90 days. Certification shall be submitted to CDOT to verify that the product has gone through this process.
2. Eradicate harmful pathogens, including coliform bacteria.
3. Create a carbon to nitrogen ratio of 15/1 to 25/1.
4. Contain no solid particle greater than 1/2 inch in diameter.
5. Have a non-offensive smell similar to fresh turned soil.
6. Contain no significant level of dirt or soil and contain a maximum of 30% composted wood residue (pine or aspen wood).
7. The pH after composting shall be between 5.0 and 7.5 with an organic matter content of not less than 30%.
8. Soluble salts (electrical conductivity) shall not be greater than 2.3 mmhos/cm.

The Contractor shall submit to CDOT for Approval a 2-pound sample of the product four weeks before its use on the Project site. A Certificate of Compliance shall be submitted to CDOT to verify the organic matter content, pH, and carbon matter to nitrogen ratio.

Subsection 212.03 shall include the following:

All seeded areas shall be amended with composted organic amendment as shown on the plans, which shall be tilled or ripped, to a depth of 6 inches into the soil. After ripping, remove all debris such as concrete, rocks (greater than 3 inches in diameter), and other deleterious or undesirable material from the area.

17.3 Deliverables

The Contractor shall submit the following to the CDOT Project Director for Acceptance:

Deliverable	Acceptance or Approval	Schedule
Notification of use of imported topsoil	(none)	At least 30 Days prior to hauling topsoil to the Site
Certificate of Compliance for Imported Topsoil	Acceptance	Prior to hauling topsoil to the Site
Noxious Weed Management Plan	Acceptance	Within 60 Days after NTP1